4. An isolated nucleic acid segment consisting of a nucleotide sequence selected from the group consisting of SEQ ID Nos: 3-53.

6. A vector containing the DNA of claim 2 or 3.

7. The vector of claim 6, wherein said vector is a retroviral vector.

8. A host transformed with the vector of claim 6.

10. A kit for determining an alteration in a mammalian MSH5 gene by DNA amplification comprising:

a set of DNA oligonucleotide primers in a vial, set allowing synthesis of a DNA encoding the DNA mismatch repair gene, wherein said primers are selected from the isolated nucleotide segments of claim 3.

12. The kit of claim 10, wherein said primers consist of the primers selected from the group consisting of SEQ IDs:3-50.

39. The isolated and purified nucleotide segment of claim 2, wherein the nucleotide segment is the coding region of SEQ ID NO:1.

40. An isolated and purified nucleotide segment having the sequence set forth in SEQ ID NO:1, wherein the nucleotide segment is mRNA or cDNA.

41. An isolated and purified nucleotide segment, wherein said nucleotide segment is a fragment of at least 17 contiguous nucleotides of SEQ ID NO: 1, with the exception that said fragment cannot be selected only from base pairs 1908-2900, and wherein said nucleotide segment is mRNA or cDNA.

42. An isolated and purified nucleotide segment encoding the amino acid sequence of SEQ ID NO:2, wherein said nucleotide segment is mRNA or cDNA.

43. The isolated and purified nucleic acid segment of claim 2, wherein said nucleotide segment consists of SEQ ID NO:1.

44. The isolated and purified nucleic acid segment of claim 3, wherein said nucleotide segment consists of said fragments of SEQ ID NO:1.

45. An isolated and purified nucleotide SEQ segment consisting of

(a) at least one exon from SEQ ID NO:1 wherein starting at position 235 and continuing continuously, exon is 221 basepairs, exon 2 is the next 160 basepairs, exon 3 is the next 124 basepairs, exon 4 is the next 81 basepairs, exon 5 is the next 63 basepairs, exon 6 is the next 122 basepairs, exon 7 is the next 110 basepairs, exon 8 is the next 36